California Climate Change Center

Contract #: 500-02-004
Contractors: University of California, Berkeley; Scripps Institution of Oceanography, and other research institutions
Contract Amount: $3,600,000
Match Funding: $1,600,000
Contractor Project Manager: Michael Hanemann (UC Berkeley) and Dan Cayan (Scripps), and others
Commission Project Manager: Guido Franco
Commission Contract Manager: Michael Magaletti

The Issue

Climate change could affect California's environment, economy, and citizens substantially, particularly through changes in timing and amount of precipitation and higher temperatures. Already, spring watershed runoff as a fraction of the total yearly runoff has decreased nearly 12% in some California river systems,[1] which could be an early indication of global warming. One recent climate modeling project estimated that under a high-global greenhouse gas (GHG) emissions scenario summer temperatures could increase by as much as 15°F and reduce April 1 Sierra snowpack levels by 75%–90%.[2] Diverse sectors such as agriculture, forestry, land use, transportation, marine and terrestrial ecology, public health and safety, and energy will be affected by a changing climate.

Project Description

In 2003, in cooperation with a variety of experts and stakeholders, PIER developed a long-term climate change research plan designed to complement national and international research programs while delivering policy-relevant research products for California.[3]

That same year, the California Energy Commission (Energy Commission), through its Public Interest Research (PIER) Program, created the California Climate Change Center to carry out its ambitious climate change research plan. This virtual climate change research center conducts core research activities through two entities: the University of California, Berkeley (economics), and the Scripps Institution of Oceanography (climate). A third branch managed directly by PIER

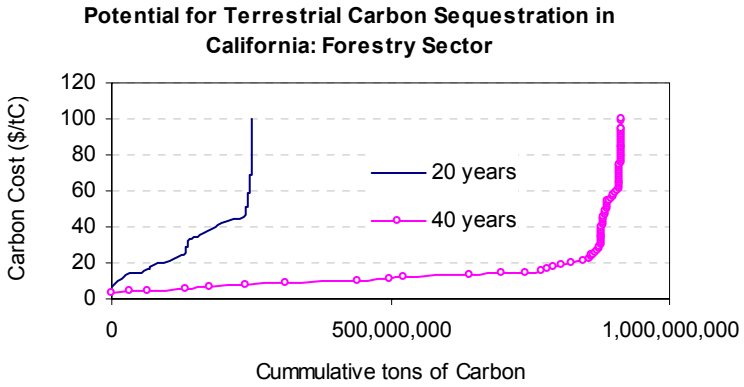
[1] California EPA-California Resources Agency. 2002. *Environmental Protection Indicators for California: Understanding Environmental Conditions through Indicators.*
[2] Hayhoe, K. et al. 2004. "Emissions pathways, climate change, and impacts on California." Proceedings of the National Academies of Science of the United States of America. 101(34): 12422–12427.
[3] Franco, G. et al. 2003. *PIER Environmental Area Climate Change Research, Development, and Demonstration Plan.* California Energy Commission, PIER Energy-Related Environmental Research. 500-03-025FS.

covers projects dealing with carbon sequestration. Finally, a competitive grant program (managed by the University of California Office of the President) funds complementary research projects not covered by the other three branches. Projects in the grant program includes a variety of topics, such as the development of a new dynamic ecological model for California and the installation of climate monitoring stations in key areas in California.

In addition to funding, the Center helps to integrate and coordinate this cross-disciplinary research among other projects and entities. This integrated approach leverages resources and expertise, and helps to ensure that results are applicable and relevant for informing policy. Provided below is a snapshot of the Center's current activities.

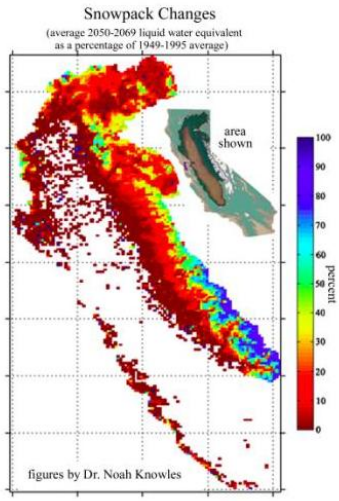
Mitigation (to reduce greenhouse emissions)

- Develop a macroeconomic model for California to study the economy-wide implication of GHG reduction efforts.
- Study options to reduce non-CO_2 emissions in the state.
- Assess the potential to sequester carbon in terrestrial ecosystems and geological formations.
- Evaluate the potential to increase carbon in agricultural soils.



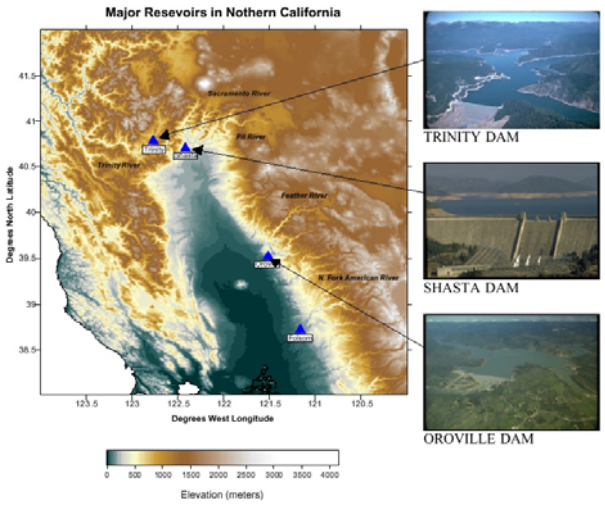
Impact Studies (to address physical and economic impacts)

- Install climate monitoring stations in key areas.
- Study climatic trends within the state.
- Develop probabilistic climate projections for California.
- Explore the role of aerosols on climate.
- Research potential impacts on snow accumulations and river flows.
- Study potential impacts on specific sectors/areas such as hydropower production, agriculture, energy demand, coastal properties, and public health.



Adaptation (to mitigate the expected adverse effects).

- Develop a dynamic ecosystem model to investigate conservation strategies to preserve California's rich biodiversity.
- Demonstrate the use of probabilistic forecasting tools to improve California's water reservoir management and to adjust current operations to reduce adverse impacts.



PIER Program Objectives and Anticipated Benefits for California

This project offers numerous benefits and meets the following PIER program objectives:

- **Providing environmentally sound energy services and products.** The research conducted under the umbrella of the California Climate Change Center focuses on measuring, quantifying, and addressing: (1) the impacts of power production and use on California's climate and that of the Western region, and (2) the impacts of a changing climate on the state's environment, economy, and health. This work provides decision makers with reliable, state-of-the-science climate change information that can help them address those impacts.
- **Providing reliable and affordable energy services and products.** Current climate change modeling predicts a hotter, drier California in this century. Such a scenario would reduce the capacity for hydroelectric power to meet needs that would be increasing from a burgeoning population and longer, more intense heat waves. This research focuses on methods to avoid or adapt to such scenarios.
- **Providing safe energy services and products.** Fossil-fuel energy production increases the amount of greenhouse gases in the atmosphere, which leads to hotter temperatures and associated health problems, such as heat stroke and increased ground-level ozone (smog), which can lead to respiratory problems. The data developed as the result of California Climate Change Center equips decision makers with the information they need to address these potential health impacts.

Final Report

The final California Climate Change Center project reports are posted on the California Climate Change Portal website, at http://www.climatechange.ca.gov/index.html.

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